



BANQUE  
DE LUXEMBOURG

## Private Bank Virtualizes Data Centers for IT, Business, and Environmental Benefits

### Overview

**Country or Region:** Luxembourg

**Industry:** Financial services

### Customer Profile

Banque de Luxembourg was founded in 1920 in Luxembourg and is one of the Grand Duchy's top financial institutions.

### Partner

HP is a world leader in information-technology solutions and services.

### Business Situation

Bank executives wanted to consolidate the bank's data centers for faster solution delivery, slower server hardware acquisition, and control of IT costs.

### Solution

A virtualization platform of 50 Hyper-V<sup>™</sup>-based virtual machines in a high-availability configuration on 7 servers, based on Windows Server<sup>®</sup> 2008.

### Benefits

- Faster solution deployment
- Greater application availability
- Improved user productivity
- Optimized infrastructure

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Xavier Granveaux, Virtualization Project Manager, Banque de Luxembourg

Banque de Luxembourg is one of that country's leading private banks, serving private investors across the continent. To uphold its tradition of innovation and demonstrate its commitment to environmental responsibility, the bank decided to consolidate its data centers through virtualization technology. Using Windows Server<sup>®</sup> 2008 Datacenter with Hyper-V<sup>™</sup> technology and Microsoft<sup>®</sup> System Center Virtual Machine Manager, the bank implemented 50 virtual machines in a high-availability configuration running on seven physical servers. Now, it is expediting the deployment of new hardware and software, delivering line-of-business applications to users one week faster than before, boosting application availability, and simplifying data-center management. It also will reduce the need for computer hardware, power and cooling, and office space, for a more cost-effective environmentally sound operation.

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Régis Heil, Head of Technical Assistance Center, Banque de Luxembourg

## Situation

Founded in 1920 and headquartered in Luxembourg, Banque de Luxembourg serves private investment customers throughout Europe and is considered one of the country's leading asset managers. In 2007, the bank's €6.1 billion (U.S.\$9.7 billion) in assets under custody represented an increase of 8.8 percent over those of the preceding year; its income of €235.5 million (U.S.\$346.2 million), a 14.8 percent increase; and its net profit of €71.7 million (U.S.\$105.6 million), a 3.6 percent increase.

In its efforts to provide top-notch service to the individuals, families, and private equity investors who constitute its customers, Banque de Luxembourg blends the best of the old and the new—its foundation in the economically and politically stable Grand Duchy of Luxembourg, which in recent years has led the world in per-capita gross domestic product, and its commitment to using the most advanced and powerful information technologies to optimize resources.

In this spirit, bank executives recently decided to redesign the organization's entire IT environment, with a focus on consolidating two data centers with the help of virtualization technologies. In these data centers, which included a total of more than 250 physical servers, the bank ran its most critical line-of-business applications and managed more than 15 terabytes of enterprise data.

By using server virtualization to consolidate the data centers, Banque de Luxembourg executives hoped to accomplish three goals. First, they wanted to make IT operations more efficient by reducing the time required to deploy new line-of-business applications. Because many new applications necessitated the deployment of a new physical server, the

bank routinely spent up to a couple of days on this task.

“This was not the best use of our valuable IT professionals' time,” says Régis Heil, Head of Technical Assistance Center, Banque de Luxembourg. “Nor did we want our users having to wait any longer than necessary to begin taking advantage of these applications to enhance their delivery of services to customers.”

Second, Banque de Luxembourg executives wanted to maintain their organization's reputation for the highest levels of customer service by boosting application availability and minimizing service interruptions. “Our reliability, availability, and uptime were good, more than three nines,” Heil says. “But we are always striving to make those numbers higher.”

Third, the executives wanted to demonstrate the bank's ongoing commitment to corporate responsibility by implementing a more “green” approach to IT resource usage. “We wanted to reduce our need for new server hardware as well as the additional power and cooling required for every additional server we installed,” explains Xavier Granveaux, Virtualization Project Manager, Banque de Luxembourg. “This was a pressing concern, as in recent years our server base had grown at a rate of three new servers every month.”

The executives also hoped to reduce the costs associated with the additional staff required to maintain and service that hardware. “We like to minimize the need for additional office space as we grow our business,” Granveaux adds. “This is especially important considering that Luxembourg is among the top dozen most costly cities in the world for purchasing or leasing commercial real estate.”

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Xavier Granveaux, Virtualization Project Manager, Banque de Luxembourg

## **Solution**

Banque de Luxembourg executives decided to use virtualization for consolidating the data centers because they considered it an essential component of what Stéphane Gérard, Production Manager, Banque de Luxembourg, calls “the IT of the future.” The executives also had some experience with virtualization, having used Microsoft® Virtual Server 2005 as a test infrastructure for developers and noncritical servers, and VMware 3.5 as a host for the institution’s Web servers.

## **Total Cost of Ownership and Integration**

Seeking the most powerful, all-encompassing approach they could find for their server virtualization project, bank executives selected the Windows Server® 2008 Datacenter operating system and Hyper-V™ technology, to implement the virtual machines, and System Center Virtual Machine Manager 2008 to manage the virtualized environment. Toward that end, the bank joined the Microsoft Virtualization Rapid Deployment Program.

“We were particularly impressed by the integration of the Hyper-V feature in Windows Server 2008 and two consequent advantages: a projected total cost of ownership [TCO] lower than that of competitive technologies and integrated failover support,” Granveaux says. “We also liked the native support in Hyper-V for high availability, its support for fast migration and virtual local area networks, and its image library, all of which we figured would help us to reduce the administrative overhead.”

For Granveaux and his colleagues, yet another administrative advantage of Hyper-V was its comprehensive integration with the Microsoft System Center family of system management technologies and the Windows® PowerShell™ command-line shell and scripting language.

“As with Hyper-V, we believed that System Center Virtual Machine Manager would deliver the lowest TCO as well as the strongest solution for simplifying and optimizing our management resources,” Granveaux says. “We especially liked its support for unified management of physical and virtual assets; its robust high-availability capabilities, particularly for managing Windows Server 2008–based failover clusters; its support for physical-to-virtual and virtual-to-virtual conversions for rapid provisioning; and its image library.” The System Center Virtual Machine Manager library is designed to enable rapid provisioning of new virtual machines.

## **Deployment, Step-by-Step**

Banque de Luxembourg launched its virtualization/consolidation project in mid-2008 while Hyper-V and System Center Virtual Machine Manager were still in beta release. To help determine the best server candidates for virtualization, the deployment team used the Microsoft Assessment and Planning (MAP) Toolkit 3.0. “The MAP technology was a tremendous help in this phase of the process,” Granveaux explains.

Members of the deployment team, who worked in partnership with HP Belgium & Luxembourg, initiated the project in a series of three, carefully thought-out steps. First, the team members deployed a Hyper-V–based virtual machine on a single, stand-alone node with a Serial ATA disk drive for the purpose of testing the prerelease product as it evolved toward production release. Second, they deployed a Hyper-V–based virtual machine on a two-node cluster connected to a storage area network (SAN) for the purpose of testing the product’s clustering capabilities. Third, they deployed a Hyper-V–based virtual machine on a four-node production cluster, also on a SAN, and migrated the virtual machine to that cluster.

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Pierre Galteau, System Engineer, Banque de Luxembourg

Over the following three months, team members completed the implementation of a virtualization solution that today consists of 50 Hyper-V-based virtual machines in a high-availability configuration running on seven physical servers. These servers, mostly HP ProLiant BL680c G5 Server Blade machines, are among the bank's 300 servers. They reside in two data centers, rely on IBM System Storage DS8100 for large-scale storage, and are connected by a single wide-area network. These data centers support all 750 of the bank's employees (using 1,200 desktop and portable computers), who are working at eight different Banque de Luxembourg locations.

Other Microsoft products that are part of Banque de Luxembourg's server virtualization infrastructure include Microsoft SQL Server® 2005 data management software, Microsoft System Center Configuration Manager 2007, Microsoft System Center Operations Manager 2007, and Microsoft Identity Integration Server 2003.

The relative speed and the success of the deployment process resulted not only from the Microsoft virtualization technology, but also from the powerful and flexible server hardware provided by HP. “Thanks to the efficiency and capacity of the HP ProLiant BL680c G5 systems, the virtual machines exhibited superlative performance from the very beginning,” says Pierre Galteau, System Engineer, Banque de Luxembourg.

Galteau adds that hardware supplier HP also played a significant role in helping the bank take advantage of the performance, as well as helping to make the project an overall success. “In addition to leading the virtualization installation and implementation project, HP Belgium & Luxembourg provided technical support and problem assistance,” he points out. “The support we received from HP was absolutely excellent.”

## Benefits

Through its new virtualization solution, Banque de Luxembourg has simplified application and infrastructure deployment and management and boosted application availability and flexibility. The bank also is implementing a more ecologically sound approach to computing and enjoying significant cost savings throughout its IT environment.

### **Faster Deployment of Essential Technology**

With virtualization, the bank no longer needs to devote so much of its valuable IT professionals' time and effort to the deployment of new hardware and software. “Instead of spending two days to deploy a new physical server, our IT professionals can deploy a virtual machine in just an hour,” Heil says.

The ability to deliver applications faster comes from the more efficient approach to deployment and provisioning provided by virtualization. According to Franck Lartigue, System Engineer, HP Belgium & Luxembourg, bank developers are using the virtual machines to create and test system and application scenarios in secure, isolated environments that replicate the behaviors of physical servers and clients.

“In the past, provisioning a new business application required one or two days, but now it requires less than an hour,” says Lartigue, who consulted extensively on the bank's virtualization project. “This delivers essential applications that much sooner to users, who can apply the technology toward better serving bank customers.”

### **Greater Application Availability for Better Customer Service**

As Galteau explains, these important bank applications are expected to be highly reliable and readily available to users. “Thanks to the interoperability that Hyper-V provides through

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its open virtual machine format, we will be able to virtualize our most demanding applications, better balancing 32-bit and 64-bit workloads and freely integrating different operating systems,” he says. “The result will be a data center that is far more robust and applications that are far more available for the bank employees who use them to respond rapidly to customer requests.”

It is not Hyper-V–based virtualization alone that is expected to boost application uptime at Banque de Luxembourg, Galteau adds. It is also the comprehensive integration of Hyper-V into Windows Server 2008 and the subsequent ease of creating failover clusters and implementing post-incident recovery, as well as the simplified management enabled by System Center Virtual Machine Manager.

“With the help of System Center Virtual Machine Manager features like real-time backup and fast migration, we expect to minimize planned and unplanned downtime and dramatically improve our service continuity,” Galteau says.

Granveaux adds that these, and other, features of System Center Virtual Machine Manager are easily accessible by system administrators through the Administrator Console. Such features include compatibility with existing system-administration solutions, which simplifies infrastructure management and supports data-center self-administration, as well as automatic reconfiguration of virtual systems and flexible control of resources, which helps administrators to maintain a robust IT environment and anticipate problems.

“The bank uses System Center Virtual Machine Manager at all levels of the infrastructure, on virtual and physical elements, various virtualization platforms, hardware, and even applications and services,” Granveaux explains. “With System

Center Virtual Machine Manager, we have a single management terminal for all technical teams, a big step forward in our optimization and standardization effort.”

#### **Optimized Infrastructure for Resource and Cost Savings**

By consolidating its data centers through virtualization, Banque de Luxembourg has significantly reduced the number of physical servers it needs to run a new core banking solution, for example, and other line-of-business applications. “When we started planning for our new core solution, we expected it to require 50 physical servers, but through virtualization we have been able to implement it on a fraction of that—just four physical servers,” Galteau says. “I also should add that the solution runs at a very high level of performance on those servers.”

As Galteau explains, if developers’ experience with this application holds true for other applications, the bank stands a good chance of dramatically slowing the rate of new server acquisition. In turn, the bank will reduce the costs associated with new-server purchases, installation, and maintenance, as well as data-center floor space, air-conditioning, and power consumption.

“Those costs are not measured in euros alone,” Galteau points out. “By running an IT environment that is so much more efficient than before, we will be able to dramatically reduce our ‘carbon footprint’ as part of the goal to become more environmentally responsible.”

#### **“A Highly Dynamic IT System”**

Looking forward, Banque de Luxembourg IT executives are planning for near-term deployment of four more virtual machines and will eventually implement 100 additional virtual machines on the virtualization platform. By 2009, the executives anticipate that all new bank servers, with the exception

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of communications and database systems, will be implemented on Hyper-V.

The executives also are planning to further automate administration of the virtual environment using System Center Virtual Machine Manager and to incorporate System Center Configuration Manager 2007 into the infrastructure. In addition, they are considering using System Center Virtual Machine Manager to help in the management of the Web servers that are running VMware.

Whatever route the bank takes with respect to its use of Hyper-V and System Center Virtual Machine Manager, executives anticipate continued benefits in terms of IT operations, user productivity, the ability to serve customers, and corporate responsibility. "Hyper-V and System Center are giving the bank a highly dynamic IT system," says Pierre Galteau. "Using these technologies we will provide our associates with the resources they need, whenever and wherever they need them, for a more flexible, cost-effective, and environmentally sensible IT environment."

## Hyper-V and Microsoft System Center Virtual Machine Manager 2008

Together, Hyper-V technology, a key feature of the Windows Server 2008 operating system, and Microsoft System Center Virtual Machine Manager 2008 provide a reliable virtualization technology and comprehensive management solution that makes it easier for customers to virtualize their IT infrastructure and reduce costs. With integrated administration, customers can use a single console to centralize management of a heterogeneous virtual machine infrastructure; increase physical server utilization; rapidly provision new virtual machines; and provide dynamic performance and resource optimization of hardware, operating systems, and applications.

Both of these technologies easily plug into existing infrastructures so that companies can continue to use their current patching, provisioning, management, and support tools and processes. This combined virtualization technology and management solution also provides great value, because customers can make the most of their IT professionals' skill set, the breadth of solutions from Microsoft partners, and comprehensive support from Microsoft.

For more information, go to: [www.microsoft.com/Hyper-V](http://www.microsoft.com/Hyper-V)  
[www.microsoft.com/scvmm](http://www.microsoft.com/scvmm)

### Software and Services

- Microsoft Server Product Portfolio
  - Windows Server 2008 Datacenter
  - Windows Server 2008 Hyper-V
  - Microsoft System Center Virtual Machine Manager 2008
  - Microsoft System Center Configuration Manager 2007
  - Microsoft System Center Operations Manager 2007
  - Microsoft Identity Integration Server 2003

- Microsoft SQL Server 2005

### Technologies

- Active Directory

### Hardware

- HP ProLiant BL680c G5 servers, four Intel Xeon 7340 quad-core processors
- IBM System Storage DS8100

### Partner

- HP